

**WHAT IS CLAIMED IS:**

1. A method comprising:

generating an electromagnetic radiation;

linearly polarizing at least a portion of the  
radiation in a vicinity of a pupil plane of a projection  
5 system to form linearly polarized radiation; and

exposing a substrate using the linearly polarized  
radiation at a high exposure angle.

2. The method of claim 1, wherein said linearly polarizing  
the radiation comprises linearly polarizing the radiation  
10 in a direction dependant upon the exposure angle of the  
radiation.

3. The method of claim 1, wherein said linearly polarizing  
the radiation comprises increasing a proportion of  
radiation polarized in a direction substantially  
15 perpendicular to a propagation direction and  
substantially parallel to a surface of the substrate.

4. The method of claim 3, wherein increasing the proportion  
of radiation polarized in the direction comprises  
completely linearly polarizing the radiation in the  
20 direction.

5. The method of claim 1, wherein said linearly polarizing the radiation comprises transmission polarizing the radiation at the pupil plane.
6. The method of claim 1, wherein said linearly polarizing the radiation comprises birefringence polarizing the radiation at the pupil plane.
7. The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing an annular ring of radiation at the pupil plane.
8. The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing radiation in an opposing pair of regions at high exposure angles in the pupil plane.
9. The method of claim 1, wherein said high exposure angle is an angle greater than  $45^\circ$ .
10. The method of claim 1, wherein exposing the substrate comprises exposing the substrate at a low exposure angle using circularly polarized radiation.
11. The method of claim 1, wherein exposing the substrate comprises exposing the substrate using an immersion lithography system.

12. A method comprising:

generating an electromagnetic radiation;

shifting a phase of some of the radiation using an  
alternating phase shift mask to define a pattern, the  
5 pattern including

first features oriented with a main axis in a  
first direction and

second features oriented with a main axis in a  
second direction, the second direction being  
10 substantially perpendicular to the first direction;

linearly polarizing at least a portion of the  
radiation to form linearly polarized radiation; and  
exposing a substrate using the linearly polarized  
radiation at a high exposure angle.

15 13. The method of claim 12, wherein said linearly  
polarizing the portion comprises linearly polarizing the  
portion substantially perpendicular to a propagation  
direction and substantially parallel to a surface of the  
substrate.

20 14. The method of claim 12, wherein said linearly  
polarizing the portion comprises linearly polarizing the  
portion in a vicinity of a pupil plane of a projection  
system.

15. The method of claim 12, further comprising exposing the substrate at a low exposure angle using a second portion of the generated electromagnetic radiation, the second portion not being linearly polarized.

5 16. The method of claim 15, wherein said exposing the substrate using the second portion comprises exposing the substrate using circularly polarized radiation.

17. The method of claim 12, wherein said exposing the substrate comprises exposing the substrate using  
10 radiation forming an annular ring in the pupil plane.

18. The method of claim 12, wherein said exposing the substrate using the first portion comprises polarizing the electromagnetic radiation using a reflection polarizer.

15 19. The method of claim 12, wherein said high exposure angle comprise an exposure angle greater than 45°.

20. A lithography system comprising:  
a stage to immobilize a substrate;  
an electromagnetic radiation source to emit a  
20 radiation; and  
a projection system having a polarizer in a vicinity of a pupil plane to increase a proportion of radiation

linearly polarized in a direction substantially  
perpendicular to a propagation direction of the radiation  
and parallel to a surface of an immobilized substrate.

21. The system of claim 20, wherein the polarizer

5 comprises a perfectly linear polarizer to perfectly  
linearly polarize the radiation.

22. The system of claim 20, wherein the polarizer

comprises a high exposure angle polarizer to increase the  
proportion of linearly polarized radiation that is to  
10 expose the substrate at a high exposure angle.

23. The system of claim 20, wherein the polarizer includes  
an opposing pair of polarizing regions at high exposure  
angles.

24. The system of claim 20, wherein the projection system

15 further comprises a unitary polarizer to increase the  
proportion of linearly polarized at the pupil plane.

25. The system of claim 20, wherein the polarizer  
comprises a transmission polarizer.

26. The system of claim 25, wherein the transmission

20 polarizer comprises an annular ring of polarizing  
features.

27. The system of claim 20, wherein the polarizer  
comprises a birefringence polarizer.

28. The system of claim 20, further comprising an  
alternating phase shift mask.

5 29. A lithography system for forming microelectronic  
devices, the improvement comprising a pupil plane  
polarizer to polarize electromagnetic radiation that is  
to expose a substrate at high exposure angles but not  
polarize electromagnetic radiation at low exposure  
10 angles.

30. The system of claim 29, wherein the polarizer is to  
increase the proportion of linearly polarized  
electromagnetic radiation in a direction perpendicular to  
a propagation direction of the radiation and parallel to  
15 a surface of a substrate.